

Listing of Claims

1. (Currently amended) An on board image processing apparatus for recognizing surrounding objects of a vehicle, based on image signals comprising:

an image pick-up device for picking up a circumference of said vehicle, the image pick-up device being equipped with first pixel row zones which have sensitivity to visible light and second pixel row zones which have sensitivity to invisible light;

a visible light head light;

an invisible light floodlight;

a switch for switching the invisible light flood lighting; and

an image signal processing section for recognizing the objects using visible light zone image signals obtained from the first pixel row zones and image signals obtained from the second pixel row zones,

wherein said image pick-up device compares said objects when said invisible light floodlight is on to said objects when said invisible light floodlight is off.

2. (Previously presented) The on board image recognition apparatus as defined in claim 1, wherein an infrared light is used as the invisible light.

3. (Original) The on board image recognition apparatus as defined in claim 1, wherein ultraviolet light is used as the invisible light.

4. (Original) The on board image recognition apparatus as defined in claim 1, wherein each of the first pixel row zones of the image pick-up device that are sensitive to visible light are constituted by each of the first light sensitive elements sensitive to visible light, and each of the second pixel row zones of the image pick-up device that are sensitive to the invisible light are constituted by second light sensitive elements sensitive to invisible light.

5. (Original) The on board image recognition apparatus as defined in claim 4, wherein the image pick-up device has a first filter that transmits visible light disposed in front of the first light sensitive elements to constitute first pixel row zones, and a second filter that transmits invisible light disposed in front of the second element to constitute the second pixel row zones.

6. (Original) The on board image recognition apparatus as defined in claim 1, wherein each of the first pixel row zones sensitive to visible light and each of the second pixel row zones sensitive to invisible light are constituted by pixel rows arranged in the horizontal direction, both of the pixel row zones being arranged in perpendicular direction alternatively.

7. (Original) The on board image recognition apparatus as defined in claim 6, wherein the density of the first pixel row zones sensitive the visible light is higher than that of the second pixel row zones sensitive to the invisible light in the image pick-up device.

8. (Original) The on board image recognition apparatus as defined in claim 1, wherein each of the first pixel row zones sensitive to the visible light and each of the second pixel row zones sensitive to the invisible light are constituted by pixel rows arranged in the perpendicular direction, both of the pixel row zones being arranged in the horizontal direction alternatively.

9. (Original) The on board image recognition apparatus as defined in claim 1, wherein the image signal processing section recognizes a high reflection object and a low reflection object based on information of difference value between the first pixel row zones and the second pixel row zones that adjoin each other in the horizontal direction or the perpendicular direction.

10. (Original) The on board image recognition apparatus as defined in claim 9, wherein the image signal processing section recognizes, based on the recognition results of the high reflection object and the low reflection object, at least one of a preceding car, an oncoming car, a reflector and a traffic signal.

11. (Original) The on board image recognition apparatus as defined in claim 1, wherein the image signal processing section performs controlling of turn-on of invisible light floodlight, based on the visible light image signals.

12. (Original) The on board image recognition apparatus as defined in

claim 1, wherein the image signal processing section detects a run lane based on the detected object.

13. (Original) The on board image recognition apparatus as defined in claim 1, wherein the image signal processing section uses selectively, based on the state of turn-on of the invisible light floodlight, the visible light image signals and the invisible image signals to create image signals for displaying on a monitor screen.

14. (Currently amended) An on board image recognition apparatus comprising:

a visible light head light;

an invisible light floodlight;

a switch for switching the invisible light flood lighting;

an image pick-up lens; and

an image pick-up device,

wherein there is disposed between the image pick-up lens and the image pick-up device a filter having an area that transmits visible light and an area that intercepts the visible light, and

wherein said image pick-up device compare an image when said invisible light floodlight is on to an image when said invisible light floodlight is off.

15. (Original) The on board image recognition apparatus as defined in

claim 14, wherein the image pick-up device is a CCD for monochrome.

16. (Currently amended) An on board image recognition apparatus comprising:

a visible light head light;

an invisible light floodlight;

a switch for switching the invisible light flood lighting;

an image pick-up lens[:]; and

an image pick-up device,

wherein the image pick-up device is constituted by a photo sensitive element having sensitivity to visible light and a photosensitive element having sensitivity to invisible light, and

wherein said image pick-up device compare an image when said invisible light floodlight is on to an image when said invisible light floodlight is off.